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ABSTRACT

This description of activities initiated through the Computer Technology Project of the provincial education ministry in Alberta, Canada, covers the 2-year period beginning with establishment of the project by the Alberta Department of Education in October 1981. Activities described include: (1) the establishment of the Office of Educational Technology within the Department of Education, with a brief discussion of staff responsibilities provided; (2) the choice of the Apple II+ microcomputer as the basic standard for educational computing in Alberta; (3) the establishment of an educational software clearinghouse for evaluating Apple II+/e courseware; (4) the coordination and development of orientation and inservice seminars for educators; (5) the administration of the Minister's Task Force on Computers in Schools, with a review of Task Force recommendations provided; and (6) other project activities related to cataloging of computer software and searching for special education courseware. (ESR)

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ALBERTA EDUCATION'S COMPUTER TECHNOLOGY PROJECT

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A. Introduction

In October, 1981, the Honorable David King announced the establishment of the Computer Technology Project. This activity was initiated to: establish an Office of Educational Technology within the Department; announce the establishment of a basic computer hardware standard for educational computing; begin an educational software clearinghouse; coordinate and deliver orientation and inservice seminars for educators; administer the activities of the Minister's Task Force on Computers in Schools; maintain an awareness of developments in the technological field as they relate to computers amd schools; collaborate with other interested provincial departments of education in various educational computing activities; and conduct or fund research and evaluation activities within Alberta.

B. Implementation

Now, almost two years later, the Computer Technology Project has been fully operational for about eighteen months. Staff members have been hired, space has been allocated, contacts with other departments of education have been established, the Task Force has made it's final report to the Minister, some research and evaluation studies have been carried out or are underway, a computer literacy curriculum at the elementary level is being implemented this fall, and the junior and senior high computer literacy curricula are being piloted at the present time.

I would like to briefly describe the rationale for some specfic policies, and to briefly present the Task Force's perceptions of the future.

C. Office of Educational Technology

The Computer Technology Project staff consists of a total of seven people. Six occupy project positions. We also have seconded a classroom teacher to provide assistance in courseware screening and evaluation.

The work is divided into a number of areas. Our Inservice Manager is responsible for the planning and coordinating of computer inservice activities for Alberta Education. A number of microcomputers have been made available for use at the workshops, and so delivery of these seminars is dependent only upon the availability of time and space.

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The other major area is the Clearinghouse. The Manager of the Clearinghouse is responsible for searching, ordering, screening, and evaluating the courseware materials. After evaluation is complete, his responsibility is to communicate the results to the field.

The Project Director and the two managers administer the Project's activities, including familiarization with new developments in the technological and software development areas. Communicating information to others means publishing a number of documents, including a tabloid that appears quarterly, and regular reports of courseware evaluation results. We serve on departmental committees involved in the development of the computer literacy curricula, and other such committees as needed.

D. Hardware Standard

Prior to the announcement of the Project, Alberta educators were making numerous inquiries to Alberta Education personnel regarding the appropriate microcomputer hardware which school systems should buy. Frequently, the person requesting the information wondered whether Alberta Education was planning to make a policy decision regarding this matter. Because provincial governments have responsibility for curriculum content, and because the educational software comprises a substantial learning resource, administrators needed this kind of information prior to investing their scarce resources in computers.

Since 1979, when Alberta Education funded a number of research projects related to the use of computers in schools, I had been named the liaison officer for studies related to computers in education. Part of my activities involved becoming familiar with microcomputer developments, with a view toward preparation of policy recommendations regarding these innovations.

Many discussions were held with fellow Alberta Education personnel, university experts, classroom teachers, school district administrators and trustees, data processing professionals, and hardware and software manufacturers. A number of issues became apparent.

For example, if no microcomputer hardware standardization were to occur, what would happen? Experience in other school jurisdictions suggested that educational software, also called courseware, would not be as readily available for some computers as it was for others. Some computers would not stand up to classroom use as well as some different brands. If a school system invested in a particular brand of computer, and the company manufacturing those computers brought out a new version, or a new model of the computer, without making the new model compatible with the old one, all of the money invested in courseware could be wasted. Buying the same courseware for new versions of the same microcomputer would not be a wise use of public funds.

Of course, another major issue is for what purpose are these computers intended? Computer literacy for teachers and students is obvious, because computerization will influence North American lives to a greater and greater extent during the next decades. There are a large number of applications, both instructional and administrative, that also are important.

Computer-Assisted-Instruction is one. Using the power and data storage capacity of the computer to guide students through a learning sequence is a natural application of this technology. Of course, computers need some instructions to do this properly, and therefore the program availability is important.

Another application in schools is to manage the instructional or learning steps. Computer-managed-learning is closely related to administrative applications. Student records, marks, planning instructional sequences, testing, review programs, and data base management are important functions for a CML program.

School building administrative applications were also considered, but in thinking about standardization this area was not viewed as being as important as computer literacy and CAI. Given the way the decision went has led to many principals using Apple computers for keeping their records and using them for administrative activities.

After the initial data was finally gathered, it became apparent that there were not that many computers from which to select. In all the North American jurisdictions that had the opportunity to standardize, only about ten had done so. We checked with them regarding their experiences, and noted their perceptions of advantages and disadvantages of making such a decision.

Finally, a decision to standardize on Apple II+ format was made. Basically, this brand was chosen because: there was more educational software available in Apple II+ format than all the other brands of microcomputers combined; the model had been used in schools for about two years, and the majority of experiences with it were positive; service for the hardware was readily available; although slightly more expensive than some of the other brands on the market, the fact that two different companies would be able to bid on the contract implied some element of competition for the business; the senior management of the computer manufacturing company was committed to upward-compatibility of software for new models of the Apple II; and no other brand of computer could match all of those characteristics.

Alberta Education did not direct school districts to purchase any particular brand of microcomputer. What was stated was that all of Alberta Education's courseware evaluation efforts were going to be directed at the Apple II+ brand, but school administrators were free to select what ever kind of computer they wanted to have. The result is that Apple II+/e's comprise approximately 60 percent of the computers in our schools.

Bids for one thousand Apple II+ computers were sought, and the successful bidder was Bell and Howell. The EduMod's were ordered and were then re-sold to Alberta school districts at the same price that Alberta Education paid for them. Within a year, all the computers were being used throughout Alberta schools.

We continue to review our decision, but until we have completed more courseware evaluations, there is little likelihood of changing that policy decision.

E. Clearinghouse

Our approach to the issue of quality educational software is to investigate the present availability of programs, to evaluate them for technical and educational value as well as applicability to the Alberta curriculum, and then we will determine in what areas educational software development is needed.

The operation of the Clearinghouse began with the hiring of a manager in the summer of 1982. Initially we searched for courseware evaluation systems already in place. Considerable credit goes to the MicroSIFT evaluation group at the Northwest Regional Educational Laboratory in Portland, Oregon for the work they have done in this area. Their director of evaluations was brought in for a series of workshops in July, 1982, to train about 40 classroom teachers to be courseware evaluators.

During the course of the subsequent few months, our evaluators and the Clearinghouse Manager decided that the evaluation process developed by MicroSIFT, and modified by the British Columbia Ministry of Education was not providing the kind of information needed by teachers and curriculum supervisors making decisions about the purchase of software. Therefore, a unique system of evaluation was developed, keeping some elements of the MicroSIFT system in place.

After the new evaluation system was developed, the teachers that had been trained initially were brought back together for further training, using this new evaluation process. During the course of this past year, almost 1,000 courseware packages have been handled. Some packages have not yet arrived from the distributor; about 100 titles are in progress at any one time; about 50 percent have been rejected, either at the screening stage or during formal evaluation; and only about ten percent have achieved any kind of offical status.

Our evaluation process consists of searching for courseware in a subject area designated by the Curriculum Branch. Only Apple II+/e software is solicited. We request the publishers or distributors for an examination copy which will be used for evaluation purposes. We inform them that if their product is highly rated, it will be made available to Alberta school systems through our School Book Branch. To date, virtually every distributor has willingly complied with our request. For further details regarding the evaluation process, please refer to Dave Wighton's article "Alberta Education's Clearinghouse: Functions and Findings".

F. Inservice

Also during the summer of 1982, an Inservice Manager was hired. It has been his responsibility to coordinate the planning, development and delivery of inservice seminars for school systems requesting this service. During the initial phases of this Project, most schools did not have their own computers, so we have been able to work an arrangement with the School Book Branch for the lease of 40 Bell and Howell EduMods to take to schools for the inservice workshops.

The Inservice Manager coordinates all of these activities. Various policies have been instituted in order to make these demonstration microcomputers as accessible as possible to as many schools as we can. They are shipped around the province using almost all modes of transportation.

During this first school year, many workshops have been for teachers and administrators who were unfamiliar with microcomputers. The content of these seminars usually began with a half-day of instruction as to what a computer is and how it operates. However, specific applications, such as courseware evaluation, availability of software, administrative applications, networking, and new developments in the high tech field, are topics being requested for seminars this autumn. This suggests that those educators that have developed an interest in computing are interested in following-up their initial training.

Even though the nature of these seminars is changing, there remain many educators who still have not become familiar with the applications of computers to their field. This past summer we cooperated with the Jasper School District and ACCESS Alberta to sponsor and deliver one-week workshops in Jasper, Alberta. Teachers were able to bring their children along for the associated computer camp. These workshops were well attended in spite of very little advertising.

G. Task Force on Computers in Schools

The intent to form the Ministerial Task Force was announced at the same time as the Computer Technology Project. In July, 1982 the first meeting of the thirteen member Task Force was held, and it's report was released one year later. Members of the Task Force were drawn from all the education stakeholder groups in Alberta, such as the Alberta Teacher's Association, the Alberta School Trustee's Association, Alberta Eduction, Alberta Advanced Education, the Curriculum Policies Committee, the Conference of Alberta School Superintendents, representatives of post-secondary institutions such as universities, colleges, and technical institutes, two members-at-large, the data processing industry, and the Home and School Association.

During the course of the year, the Task Force met about 15 times; visited schools and related institutions in Alberta, Minnesota, Texas and California; and discussed educational computing issues with the Minister of Education and various experts brought in to attend some of the meetings. A survey of Alberta schools was done to determine the number of computers in use. In addition, a number of writing sessions were held to prepare the final draft of the report.

The Task Force made a number of recommendations to the Minister. These recommendations may be divided into a number of different categories: students and curriculum; teacher training; courseware; hardware; planning; organization; and funding.

Within the student and curriculum area, it was recommended that by 1985 all students in Alberta shall have regular access to a computer learning station. Also, a review of the Program of Studies should be initiated to introduce curriculum components related to technology, to adapt the sequence, structure and design of the program of studies to accommodate continuous student progress and to encourage a personalized, self-directed learning approach.

Recommendations were made regarding preservice, inservice, graduate training, and continuing education for teachers. For example, it was suggested that by 1986, all students graduating from Alberta Faculties of Education be required to have completed a computer literacy course. For teachers coming into Alberta, the Task Force recommends that a standard 40 hour computer literacy course must successfully be completed prior to certification. Also, Faculties of Education in Alberta's universities are to offer major and minor specializations in educational computing, as well as graduate programs.

Alberta Education should offer financial incentives to enable practising teachers to undertake graduate training in educational computing was also recommended.

An inservice program is to be developed and funded by Alberta Education, local jurisdictions and the teaching profession to offer every practising teacher and educational administrator in Alberta the opportunity to learn the fundamentals of educational computing. This implementation is to begin prior to the end of the 1983-84 school year.

Regarding courseware, the government was commended for the work already begun through the Clearinghouse. This work should be expanded, the Task Force suggested. The work of providing lower prices for courseware materials also should be continued. For the software development industry, the government should encourage courseware development through incentives, funding assistance, and shared research. A series of related recommendations were made to encourage copyright law revision, marketing assistance, special needs courseware development assistance, and so on.

For hardware standards, the Task Force stated that Alberta Education ought to annually review the hardware standard already developed, and that buy-agreements be negotiated with manufacturers who meet the established hardware criteria. School jurisdictions should buy their computers from local dealers to support the business community, and to obtain better service.

With respect to educational standards, we recommend that there be one computer learning station for every eight students in a school. For Computer Assisted Instruction and business education applications, there should be one computer laboratory for every eight classrooms at the junior and senior high school levels.

Alberta Education should encourage the development of network systems, and establish a central data bank to encourage and support these networks. Network standards should be developed soon to enable school systems throughout the province to communicate with each other and with centralized data bases.

It was recommended that the development of computer peripherals for handicapped students should be encouraged by Alberta Education.

Five recommendations were made relative to planning for the future. For example, Alberta Education ought to provide bold and decisive leadership in educational computing. Alberta Education should develop a comprehensive strategic provincial plan for educational computing, to be reviewed annually. Alberta Advanced Education should develop a plan to implement those recommendations that have a bearing on preservice and graduate teacher training programs. These plans are to be developed in conjunction with post-secondary institutions and this planning is to be initiated as soon as possible.

Another recommendation was that each school jurisdiction in Alberta is to develop a multi-year educational computing plan, to be reviewed and updated at least once per year. There should be an individual to coordinate the development and implementation of the educational computing plan in each school system.

A number of recommendations relative to the funding of these recommendations were made, such as the establishment of an Alberta Heritage Foundation for Educational Computing. One of the more interesting recommendations in this section is that model high-technology schools be established and jointly funded by Alberta Education and cooperating school jurisdictions.

Finally, there were some recommendations that suggest a number of organizational actions on the part of Alberta Education. The Computer Technology Project should become a permanent Branch of government was one of them. Other recommendations include the sponsorship of an annual conference to discuss issues and directions for educational computing; and the creation of advisory committees to enhance and formalize the communications process between all sectors of the educational community.

H. Related Activities

As noted in the introduction, there are a number of peripheral areas related to computers in education where the staff of the Computer Technology Project have been active.

During the past two years, a number of provincial education ministries banded together to fund a study to survey the cataloguing and indexing of computer software development and opinions. This study, done by JEM Research of Victoria, British Columbia, suggested a number of policies that should be implemented in order to standardize the cataloguing system. This would have the effect of making it relatively easy to transfer a print data base to an electronic one when the time was right. Action on this is being considered by the Council of Ministers of Education, Canada.

Research and evaluation studies were mentioned as being part of the Computer Technology Project. One of the studies that has been supported was to search for special education computer courseware materials. This was done in order to provide some assistance to Alberta Education officials who need to know where these materials may be located, and which associations and individuals are active in this area. This study is available from the Planning Services Branch, Alberta Education, Edmonton (Special Education Courseware, by John Willson of Decision Support Systems, Edmonton).

I. Summary and Conclusions

Reactions to the Task Force report have been very positive. Many school jurisdictions in Alberta have already prepared educational computing plans for their own use. A considerable number of teachers have been taking computer inservice workshops, seminars, and credit courses, and are making themselves aware of better ways to use the computer in their instructional programs.

The presence and availability of a good quality educational courseware evaluation process is an assurance that as much good quality courseware that exists will be found and the information made available to educators. To a large extent, our original goals as set out in 1981 are well established.

However, there still exists a considerable amount of work that has to be done. For example, even though we are beginning to find a greater percentage of good quality courseware packages, there is not enough. Special needs courseware is lacking, and is very costly to produce. If all students are going to have access to a computer terminal within the next few years, a considerable dollar investment will have to be made soon. Finally, if teachers are going to make efficient and effective use of the learning materials and the hardware, they will have to learn and develop the instructional techniques necessary. This will require much research and many inservice seminars and workshops.

I would like to end with a quote from the Task Force report:

Our discussion of educational computing has been guided by an abiding concern for our children and their future. Every recommendation that we have made recognizes our shared responsibility to prepare the children of Alberta for a future which will be significantly different from the present. Much of the well-being of future generations and prosperity of our province depends upon this preparation.

We are on the verge of technical, economic, and educational change of an order not seen before. The question is not whether we can afford the effort and cost required to introduce computers into our schools. Rather, the question is whether we can afford NOT to do so.

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1. Computers in Schools , the report of the Minister's Task Force on Computers in Schools, Edmonton, Alberta Education, July, 1983, p.3.